Inside This Issue

Pikes Peak Radio Amateur Association, Inc.
P.O. Box 16521
Colorado Springs, Colorado 80935

January 1998

FIRST CLASS MAIL

1 Renew before 03/31/98
RONALD DEUTSCH
NKØP
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Ø-Beat

Pikes Peak Radio Amateur Association Officers and Directors

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*Board Mbr: Ron Deutsch	NKØP	593-8352	deutschra@aol.com
*Board Mbr: Aaron Pelouze	KD6FLM	282-9715	apkd6flm@aol.com
*Board Mbr: Jeff Boyes	NØJLX	577-6029	jboyes@usa.net

*This Officer/Director is completing the second year of the two-year term to which they were elected.

The *Ø-Beat* is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., PO Box 16521, Colorado Springs, Colorado 80935. For membership and subscription information see the last page of this publication. Monthly advertising rates: Full page, $48; Half page, $24; Quarter page, $12; Business card, $6. These rates are billed quarterly. Send your ad requests and payments to: PPRAA, PO Box 16521, Colorado Springs, Colorado 80935.

Check out the PPRAA page on the World Wide Web! Go to: http://www.oal.net/pprae

Deadline for submission of articles or advertisements is the 20th of each month. Submissions are accepted in any form. Articles should be sent directly to the *Ø-Beat* Editor (email to kd0ju-1@juno.com is preferred.) Permission is granted to reprint articles provided credit is given to both the author and this publication.

License Exams

License examinations sponsored by the Pikes Peak Radio Amateur Association are held on the 2nd Saturday of February, April, June, August, October, and December.

Testing takes place at 9 A.M. at:

Denver Technical College
225 South Union
Colorado Springs

Everyone is seated on a walk-in basis. Those wishing to take an exam should bring the following items:

1. $6.25 (preferably a check/money order made out to ARRL/VEC) for any exam other than element 1A or 2.
2. Picture identification.
3. A copy of your current amateur radio license, and/or a copy of any examination credit you have, as well as the signed original. We keep the copies.
4. A pen, pencils, and a calculator if you need one.

If you have any questions, call Erik Mugele, KGØXE at 596-5345. Please do not call Denver Technical College.

Committee Chairpersons/Contacts

Ø-Beat Editor	Bill Pierce	KDØJU	550-0406
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Auditing	Any Volunteer's?		
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Public Service	Mike Stansberry	KØTER	636-1290
Swapfest '98	Carlos Caro	KBØREI	632-1569
Technical Instruction	Linda Hedges	KBØRKW	520-9238
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Other Organizational Liaisons

ARES Liaison	Mike Stansberry	KØTER	636-1290
CCARC Liaison	Ron Deutsch	NKØP	593-8352
RACES Liaison	Bryan Curl	NØLUF	575-8400

Reminder — General Membership Meeting

There will be NO MEETING of the General Membership of the Pikes Peak Radio Amateur Association in December.

See Announcement of Christmas Party!

January Meeting

January PPRAA meeting place (Mt Calvary Church) will be opened at 1900 (7p.m.), All are welcome to come and observe and/or participate. The program will be Home Brew.

Next Board Meeting

Next board meeting location will be announced (hopefully!) at the Regular January meeting.

Upcoming Swapfest

The Denver Radio League is proud to announce its First Annual C-Rock 'Fest on Saturday, March 14th, 1998, from 8 a.m. to 1 p.m. at the Douglas County Fairgrounds, Castle Rock, Colorado.

Talk-in will be on 146.88 Mhz. (-600 KHz).

- o Admission is $4.
- o Swap Tables, $12 in advance (includes 1 admission)
- o Tailgating, $6.
- o VE Exams.
- o Refreshments.
- o Door Prizes.
- o Special Event Station.

For table reservations and additional information, contact:

Al Cooley, NØAUS
6199 South Broadway
Littleton, CO 80121
Phone: 303-777-2428
E-mail: ALNØAUS@aol.com

HAM CLASSES

DID YOU FORGET SOMEONE ON YOUR CHRISTMAS LIST ?

CAN'T FIGURE OUT WHAT TO GIVE THEM ?

TIMES A WASTING - BETTER HURRY

The answer may be to register them in the new and upcoming Novice/Technician - No Code HAM Classes starting on January 12th, 1998 and continuing for nine (9) weeks. The price is right, FREE (for the classes, $19.00 for the "Now Your Talking" Book and $6.50 for any testing above Novice level).

Classes will be held at the Tesla Society, 2230 East Bijou Street, Colorado Springs, Colorado starting at 7PM MST, Monday and Wednesday evenings. Registration should be done on or before January 3, 1998. Registration can be made through Frank or Barb McNally - at (719) -596-8733 or E-Mail at warmfuzzy@bigfoot.com or contact Linda Hedges- at kbØrkw@juno.com.

ARES TRAINING

The training for January 10th has been opened up to take 50 sign-ups.

If you have ever wanted to hear Skee Hipszky do his Winter Preparedness talk, here is your chance. Also for those of you who have already signed up, and for new sign-ups as well, the time has changed. We will start the training off with coffee and donuts at 8:30 a.m. This time will also be a sign-up time.

Training will start at 9:00. The first hour will be Skee's presentation, then a break. During this break we will check out KØTER's truck and check out what he carries at all times. Then we will begin our ARES basic training course. We will also be doing a couple of exercises. We should be done by 12:30pm. You may respond to me to sign up via email, phone (528-8361), or on the ARES Net tomorrow evening. We need 30 more sign-ups.

Ginger NØUOD
PPARES Dist.14 Training Coordinator

Elmer Net

KBØRLF and NØUOD invite all Hams to listen to and join in the Elmer Net. The place is the 146.97 repeater.
The time is 7:30pm and the day is Monday. We also invite suggestions for topics and speakers.

Hope to hear you all on the net!

Roger KBØRLF, net Manager

Ginger NØUOD,
Net Control

OM/YL
LUNCH BUNCH

It has been suggested that we have the January Lunch Bunch get together at a place that we have not been to before.

Sooo. At noon time ,on January 22nd,we will meet at The Retired Enlisted Association,chapter 1. The address is 834 Emory Circle. We will be on 146.52 for talk in. They have very reasonable price meals and we can order from the menu. They also have two specials each day.

Hope to see you there!

If you have a question my phone 471-9965.

73
WAØMNL, Rosie

Treasurer's Report
for period ending 10/31/97

Treasurer's Report
for period ending November 30, 1997

Income - Expenses = Gain/(Loss)
General Fund: 130.50 - 647.53 = (517.03)

Contact me if you would like a more complete report. The expenses above include a down payment on the rental of Doherty High School for the May 2 swapfest. The raffle prizes are accounted for separately from the general funds.

As we move into the holiday season, I'm wrapping up some odds and ends. I've sent the amendment to the Articles of Incorporation in to the secretary of state at Al Vrooman's request. I haven't received anything back yet, so I don't know if all the paperwork is in order.

As you may have heard by now, Carlos Caro KBØREI has stepped down as hamfest chairman. This leaves us in the committee without a committee chairman.

"Us" is Dennis Major KBØSXC, Phil Pearsall KC5LXC, Russ and Rosie Calaway KBØFNM and WAØMNL, John Roth NØQJS and myself. We've been keeping things running but sure could use one person coordinating the effort. If you've done this in the past and want to step up to the task, please contact Greg or drop by our next swapfest meeting. We're still holding them religiously on the 1st Saturday of each month at 1000 at the COS PD station, 7850 Goddard St.
As for the current status, we have all the raffle prizes purchased, and the raffle tickets have been printed and are ready for sale.
We have our raffle license. Ron Deutsch NKØP has been taking care of the ARRL sanctioning. We'll be selling tickets at the first 1998 swapfest in Loveland on the 10th of Jan, and again on February 15. If you can sell tickets for us, please contact me.

That's about it for now. I'm writing this before Christmas, but by the time you'll read this it should be early 1998. Hope everyone has a great and prosperous New Year!

Rob/N7LV, Treasurer
http://www.qsl.net/n7lv/treasury.htm

Letter to the editor
Ø-BEAT editor. Would you please note my change of address and tell all club members for me and also the lunch bunch that I wish I could be there to enjoy with them and I would like to express HOLIDAY GREETINGS to all even if it will be January when this gets into Ø-beat. (Done, ed.). Most members know me well and same to the ones that don't know me but wishing all involved a very MERRY XMAS and HAPPY and also VERY PROSPEROUS NEW YEAR with good health to all from WILL, NØHRD in warm, sunny ST. ØzPETES,FLA.

WILL ZIMMERMAN
NØHRD ADV
4724 Lake Charles Way North
Kenneth City, FL 33709-3618

Many thanks Bill and keep up the good work.

73 to all for the time they put in to make the PPRAA what a

grand organization it really and truly is...

Sincerely yours,
NØHRD, WILL

Belated, but better late than never, I hope.

Silent Key

KAØMTX, Ralph Streamer, became a silent key on November, 29 1997.

At the age of 19,in 1935,Ralph joined the United States Army and then he became part of the United States Air Force in 1947.

When he first went into the service he was in the artillery. They used horses at the time, Ralph said that he didn't care much for the horses and that the horses didn't care much for him. On the way to the stables they had to walk past the radio facility. He could hear the code... and was fascinated by it. So he applied for a transfer to the radio division.
Ralph told me that the radio op's were given head fones, over which code was sent to them eight hours a day. Ralph became a proficient code operator. He retired after 22 years in military service.
Ralph had a state of the art keyer, but often times he would operate a hand key in the Novice band to help newcomers. He especially enjoyed the New Years eve straight key night.

Ralph and his wife, Connie, KAØPXE, celebrated over 56 years of married life. They belonged to local repeater groups, the 10-10 club, the PPRAA, they helped with many of our club activities and public service events.

Ralph became disabled while on active duty with the military. After he was discharged he attended and graduated from Colorado College. He had a keen mind all his life. Connie said that they always had a ham radio with them. Ralph always kept up with modern technology, such as code sent on the computer. He bought one of the latest tiny cross band two meter radios. He marveled at how the radios had changed since the "horse age", as he called it.

We buried KAØMTX, Ralph, with full military honors on December, 2 1997. Our sympathy goes to Connie, KAØPXE, their daughter, Darla, KB7VDK, and son-in-law, Dave, WA7SDO, Copland.

Ralph, will be missed by the Ham community.

If you sell any item, please email or call the editor to add to or discontinue your ad. All ads will be discontinued after two issues unless notified otherwise or if space needed for other reasons.

Thanks,
Editor

Dits and Bits

- 10-meter Realistic (HTX-100) SSB/CW radio and 10-meter Ringo Antenna, New condition, Best Offer, Call Christy evenings or weekends (719) 495-8862

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WANTED

I am looking for a 1S5 and a 1T4, 7 pin peanut tubes.

Paul, wØrw

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- FT 101B transceiver
- FV101ext VFO
- SP 101PB/Speaker/phone Patch
- FC-1 Freq. Counter
- D 104 Mike
- Memorex Power Center

As a Package, all for $475 obo.
Thanks, George WBØDUM @ 719 495 3983 or ghlock@pcisys.net

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For Sale:

- Wilderness Sierra in very good condition with KC-2 installed. Includes 40 and 20 meter modules. Works perfectly, has 5 watt mod, actually gets about 4 watts. Has ABX which provides great selectivity adjustment. Otherwise unmodified. This Sierra is surplus, have another one, really don't need 2. Complete documentation

on Sierra and KC-2 included. In kit form, current cost is $365 + shipping

$425 firm shipped

Alan, N3BJ

Editor's Note: There was no phone number with this. So if you need to contact Alan, it will have to be radio!

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For Sale:
Portable Antenna base..
KBØFNM, Russ...471-9965

For Sale:

- Kenwood TS-830 & MC-50 mike $500.
- Ameritron AL-811 Amplifier $450.
- MFJ-202B RF Noise Bridge $35.
- MFJ-949B Versa Tuner II $60
- Heathkit HD-1410 Electronic Keyer $15.
- Digital VT-220 Terminal $20.

Feature Article

Why Are Antennas Built to Look Like They Do?

Published by The Tech Bench Elmers Amateur Radio Society

By John Wendt WA6BFH

We come to recognize the proportionate shape and appearance of antennas. If we see a half wavelength dipole we recognize it for the antenna it is When we see a Ground Plane antenna we know what it is. It's just the same as when we see a Ford automobile next to a Volkswagen we know which is which. It is possible though for Ford to build a car that looks like a Volkswagen but, it's not possible to build a dipole that looks like a Ground Plane, or a "J" antenna that does not look like the letter J! Let's investigate this, and in fact we can start with the "J" antenna as our object model.

"J"

Observe that the vertical portion of the letter J is about two times higher than the portion that forms the crook of the J, or we could say that the height of the J is three times the height of the crook. It is for this reason that the J antenna got its name.

The crook portion of a J antenna forms a "Linear Impedance Matching Transformer" or "Q-Line" transformer because of these two parallel conductors that are 1/4 wavelength long. Above this Q-Line is the radiating portion or "radiating element" that is 1/2 wavelength long.

At the bottom end of this quarter wavelength Q-Line that is electrically shorted together, there is a dead short zero Ohm impedance. One-quarter wavelength above this dead short is an infinitely high impedance of thousands of Ohms. This is how any Q-Line device such as a "Bazooka Balun" works.

Now some that have read this article so far might be scratching their chins about now thinking, he said the radiating element is 1/2 wavelength long. Gee, a dipole is one half wavelength long! That's right, a "J" antenna is merely an "end-fed" dipole! Another name for an end-fed dipole is a "Zepp", because this form of dipole was first used on Zeppelins. So how is the more common version of a dipole different?

In the J antenna we feed the dipole on its end at the high voltage point of the antenna. If we feed it at the center at its high current point, we will see a much lower impedance or alternating current (AC) resistance. In fact the characteristic "radiation resistance" of a center fed dipole in free space is 72 Ohms. Free space by the way means that the antenna is several wavelengths above the ground, or any other conductive object. Usually free space means at least 10 wavelengths but, for practical design considerations 3 to 5 wavelengths is often times hard enough to achieve!

What happens if we feed a dipole not at the center, and not at its end but, half way in between This sort of dipole we call a "Windom" named after the

antenna's originator. This type of dipole has a characteristic impedance or radiation resistance of 600 Ohms. This feature allows this sort of dipole to be operated on almost any frequency within several octaves of its design frequency, and always present a relatively moderate impedance and consequently a decent "SWR".

Next let's take a look at "Ground Plane" antennas, afterall, aren't they just another variation on a dipole? Well, it's certainly true that they are "current-fed" at the center of one half wavelength. If you have ever seen a Ground Plane fabricated on a chassis mount coax connector you can see how this antenna works.

You start by cutting five quarter wavelength metal rods, I have always used Brazing rod. If we were going to make such a Ground Plane for the 2 meter wavelength band we would cut these rods to about 19.25 inches. If we start by just soldering on two of them, one to the center connection, and one to one of the flange holes, we have sort of a dipole. Actually this probably looks closer to an "Inverted V" type dipole but, I think you get the picture! So, now we have one of these 1/4 wave rods connected to the center conductor of our coaxial transmission line, and one of them connected to the shield. So, why should we solder on the other three, won't the antenna work with just these two? It would work as far as the transmitter is concerned. It would have a characteristic impedance pretty close to 50 Ohms, so the transmitter would be happy! The trouble is that without the other "radials" to form a uniform "counterpoise", the antenna is not the "omni-directional" antenna we were seeking! If we left it looking like an Inverted-V, it would have a figure-eight radiation pattern broad-side to the two rods. If we provide three radials 120 degrees from one another, or four radials 90 degrees from one another, the antenna will have an omni-directional radiation pattern. By the way, the radials really should be about 5% longer than the radiating element. Also, if the antenna has 3 radials, they will have to be bent down at a lower more acute angle to achieve a 50 Ohm impedance match to the transmission line.

So, what's the bottom line to all this palaver? Simply this, all antennas, any antenna can be analyzed as to its design by analyzing its current and voltage distribution. The end or tip of the antenna is always going to represent a high impedance and high voltage point. If we measure down 1/4 wavelength we will find a high current point and a relatively low impedance. If we follow this process all the way back to the feed-point we can determine all aspects of the antenna including the antennas aperture size, and the aperture size will tell us the antenna's approximate gain. Every time you double the aperture size of an antenna you double its gain, which means you pick up 3 decibels of gain.

Lets check this out by looking at one last J antenna which has come to be called a "Super J". A Super J starts with a normal looking J just like we see so many of nowadays. At the tip top of this J a quarter wavelength phase de-coupling stub is added, and then another half wavelength dipole is placed on top of the phase decoupler. Guess what happens next, we gain 3 "dBd", or 3 dB's above a dipole reference! In "dBi" this would be 5.2 dB's compared to an "Isotropic" reference.

Terms

Q-Line, Bazooka Balun, or linear impedance matching transformer. All of these are electrically speaking the same thing. A Bazooka Balun only differs in that it is fabricated from two lengths of tubing, as well as a central coaxial inner conductor. These are all one quarter wavelength long!

Radiating Element. This term is both hard to closely define, and in fact is a bit of a misnomer. The vertical element in a Ground Plane is sometimes called the radiator or radiating element but, it really radiates in conjunction with other associated elements that form part of a half wavelength.

End-fed, and center fed. These terms are closely associated with the terms, "Voltage Fed and

Current Fed". At the end of a half wavelength there is an infinitely high impedance and consequently an infinitely high voltage. At the exact center of a half wavelength is an infinitely high current and virtually by contrast, no voltage and a very low impedance.

Characteristic Impedance: All conductors or wires have both some amount of inductance and some distributed capacitance, this in itself provides a "lumped constant" derived impedance. In various configurations such as two wires parallel to one another, a characteristic impedance will result. Wires that are brought more closely together will have a lower impedance as parallel capacitance rises, or if they are farther apart this impedance will rise as capacitance is reduced.

Radiation resistance: All antennas have a characteristic radiation resistance because of the comparative effects of their distributed inductance and capacitance. This can also be expressed as a current to voltage ratio. Whatever this ratio is, a characteristic impedance will result. For a dipole this is 72 Ohms, for a 1/4 wave Ground Plane with radials at 90 degrees to the radiating element this is about 34 Ohms, and for a 5/8 wavelength Ground Plane its about 90 Ohms.

SWR: Standing Wave Ratio is the term given to the measurement of current or voltage distribution as imposed within the antenna. It is usually measured as a voltage and therefore the term often used is "VSWR". If an antenna has a radiation resistance of 72 Ohms and we feed it with 50 Ohm coaxial cable, the SWR will be 1.44:1. If we fed a 90 Ohm antenna directly with 50 Ohm cable the SWR would be 1.8 to 1 (1.8:1 or 90/50 = 1.8).

Phase de-coupling: When ever the aperture size of an antenna is increased we have to make provision for the additional antenna elements to work in phase with the other elements. On vertical omni-directional antennas this is done by phase de-coupling half wavelength radiators with quarter wavelength phase de-couplers.

Gain: Antenna gain is often times a controversial subject. It really shouldn't be, for the following reason. Every time an antenna's aperture size is doubled, its gain will double. If I properly stack one beam antenna of equal size over its predecessor I will have doubled its aperture size. If I ignore the losses imposed by the feed line and phasing network, I will have added 3 dB's of signal gain. Don't forget though, there's no free lunch. If I put a 10 dB gain antenna on a 100 foot tall tower and use poor or cheap coax cable to feed it, it may well turn out that I have less signal gain than I would have had by putting a unity gain "J" up at 30 feet with good coax.

1998 PPRAA Roster

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KØCI	STEVE	SCHAARSCHMIDT	598-3554	sschaarschmidt@csu.org
KØCST	JERALD	HANSZ	390-4106	
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K6DHV	CLARENCE	BENSON	495-8131	
KAØATW	DONALD	LEONARD	531-6652	deleonard@aol.com
KAØMTX	RALPH	STREAMER	634-1081	
KAØOYZ	ARLENE	HICKEY		
KAØPXE	CONNIE	STREAMER	634-1081	
KAØROY	RENAY	BOYES	633-5650	rmboyes@usa.net
KAØROZ	JODY	BORST	634-3995	kaØroz@kktv.com
KAØTSA	DALEAN	JANES	630-1542	
KA5SVI	MARILYN	ALLEN	380-8825	
KBØCY	BOB	WITTE	488-0859	bobw@col.hp.com
KBØEXK	GEORGE	FARINA	471-2572	
KBØEXL	LAURIE	COX	597-9760	
KBØEZG	STEPHANIE	COX	597-9760	
KBØEZH	JENNIFER	COX	597-9760	
KBØFNM	RUSS	CALAWAY	471-9965	RussRosie@KKTV
KBØIAP	MICHAEL	PROCTOR	599-3764	mproctor1@juno.com
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KBØLWE	JACK	WOOD	591-9347	jrwood@aol.com
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KBØPPM	DAN	SCOTT	635-0871	dan.scott@mci.com
KBØPQM	ROGER	SPALDING	481-7049	
KBØPTQ	JOHNNIE	NIELSEN	636-3813	
KBØQI	FAYE	HERREN	632-4674	lfach@aol.com
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KBØRKW	LINDA	HEDGES	632-5482	kbØrkw@juno.com
KBØRLD	JAMES	ISLER	488-2070	
KBØRLG	JAMES Jr.	ISLER	488-2070	
KBØSHE	DAVE	HAMMOND	632-7965	
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KDØNB	EDWARD	LUND	495-9007	76166.2132@compuserve.com
KDØQE	HERB	CHILDRESS	598-2346	herma@kktv.com
KEØOW	ROXY	VAN HOUTAN	635-4009	
KFØWF	FRANK	McNALLY	596-8733	fmcnally@market1.com
KF4B	ED	DALTON	481-4297	edalton@usa.net
KGØAE	JAMES	SUDDARTH, Jr	392-5675	kgØae@juno.com
KGØLH	BRUCE	KLICHE	536-0910	bkliche@anlt.com
KGØXW	BILL	LARSON	596-3501	
KIØBJ	REX	BLAINE	531-6450	rblaine@kktv.com
KIØGF	ROBERT	RYALS	265-9950	rryals@spacecom.afimil
KJ6IV	DICK	HUNTRODS	528-6131	dhntrds@kktv.com
KL7IBA	FRANK	VAN ZANT	633-8484	fvanzant@usa.net
KL7IPV	FRANK	DRAKE	597-2406	sirdrakejr@aol.com
KO6TN	JOHN	HERRING	380-1238	jherring@pcisys.net
KQØS	JOSEPH	MARCIANO	597-0825	
NØCMW	ALLEN	VROOMAN	520-5650	nØcmw@rmi.net
NØCTV	BOB	HAGGART	392-1617	
NØCYR	JAKE	JACOBS	UL	
NØDDF	BUD	LIBENGOOD	527-9802	
NØENN	NORMAN	MILLER	634-7574	nmiller@kktv.com
NØEOP	DAVE	SLOAN	391-0590	desloan@aol.com
NØFQB	JOSEPH	PETTA	UL	
NØHRD	WILL	ZIMMERMAN	471-8527	willzim@juno.com
NØIEM	FRANK	KALTENSTEIN	596-7980	
NØIKE	RICHARD	SWEAT	596-7773	
NØIKF	MALLORY	JEFFERIS	599-8024	
NØION	DAVID	BANKS	260-1318	david@kktv.com
NØIZQ	SARALEE	HOSEA	596-8587	shosea@kktv.com
NØJLH	JEFF	BOYES	633-5650	jboyes@usa.net
NØKIC	JOHN	CHAPMAN	635-1604	jwc@juno.com
NØKUU	LONNY	JANES	630-1542	
NØLA	PETER	LaFOSSE	495-4829	nØla@juno.com
NØLUG	LYDIA	KILE	962-9179	
NØMHQ	STEVE	BATES	637-0884	cbates1122@aol.com
NØMMP	CORRINE	HAGGART	392-1617	
NØNJW	PHILIP	ATKINSON	597-1561	phil.atkinson@symbios.com
NØNJX	WILLIAM	PETTY	532-1439	william.petty@symbios.com
NØNKG	TED	ALLISON	633-1517	teda@col.hp.com
NØNKP	KENNETH	PHILLIPS	574-6358	kiphillips@juno.com
NØOCZ	MICHEAL	MARTIN	594-9339	martinm@rmi.com
NØODD	RALPH	ROHRIG	520-5772	
NØOUD	LUCI	STANSBERRY	636-1290	jms@col.hp.com
NØPRY	SKEE	HIPSZKY	528-8361	istvan.hipszky@mci.com
NØPZU	JERRY	PRISK	574-3745	
NØQJS	JOHN	ROTH Jr.	596-6285	nØqjs@kktv.com
NØQJW	GRADY	BRANTLEY	481-2140	
NØQWO	COLLEEN	GALBRAITH	576-1343	
NØQWT	DONALD	FRENCH	598-0732	nØqwt@kktv.com
NØQWU	CHRIS	BANKS	260-1318	chris@kktv.com
NØQYW	JOHN	GALBRAITH	576-1343	
NØRNQ	ROBERT	NYMAN	574-5161	ranyman@kktv.com
NØTDS	AL	BOLGER	683-2506	abolger@delphi.com
NØTUI	JIM	AMBURN	592-9625	james.amburn@mci.2000.com
NØTUL	BILL	BRAMLEY	495-0520	billnancybramley@juno.com
NØTUU	WILL	MacDONALD	260-6074	will.macdonald@mci.com
NØUOD	VIRGINIA	HIPSZKY	528-8361	ghipszky@kktv.com
NØUVR	DAVE	KURTH	593-9686	dfk@col.hp.com

NØUVT	RICHARD	SCHARER	UL	gould-scharer@msn.com
NØVAN	CHARLOTIE	SCHARER	UL	gould-scharer@msn.com
NØVAR	ANN	LaFOSSE	495-4829	nøla@juno.com
NØVBM	JOHN	KREMER	550-1489	
NØVBQ	BOB	MANERY	635-8598	
NØVBR	MILLIE	TROTH	635-8598	
NØVLV	JAMES	JONES JR.	683-3596	
NØWPA	JEFF	RYAN	260-6826	jeff.ryan@mci.com
NØXFX	BERNIE	ROSE	473-8382	
NØXWN	MIKE	FRY	599-8187	mfry@omnipoint.com
NØXWW	CHUCK	KELLEY	632-1867	
NØXXI	SHIRLEY	ATKINSON	597-1561	
NØYCH	JOSEPH	THOMAS	391-2593	jathomas@uccs.edu
NØYGM	KEN	KNIGHT	661-3437	nØygm@juno.com
NØYTQ	KATHRYN	MARTIN	594-9339	martinm@rmii.com
NØZFX	GLORIA	RYAN	598-4077	gryan@kktv.com
NØZMA	PAUL	GOBLE	594-9319	paulg@col.hp.com
NØZVA	JULIUS	BLAIR	574-7835	
N2IWZ	AL	CRAIG	594-9288	
N5GVP	GERALD	ALLEN	380-8825	jerall@msn.com
N9HSW	LARRY	DUNN	481-0369	ldunn@rmi.net
NH6ON	NICK	POWELL	260-9321	powelln@ucsu.colorado.edu
NKØP	RONALD	DEUTSCH	593-8352	radeutsch@aol.com
WØANX	JIM	MERRILL	282-9791	
WØMCT	DOC	CORNELL	596-4216	wØmct@aol.com
WØMXY	HAL	BERGESON	471-0238	bergeson@ppcc.cccoes.edu
WØSP	HERMAN	JOHNSON	392-0131	
WØSWS	RUSS	FREYMUTH	633-8186	
WØVO	ED	MEANS	473-6174	edmeans@earthlink.net
WØYNE	WARREN	HICKEY		ahickey@juno.com
WØZHZ	DAVID	WILSON	599-3819	
W2SRQ	WILLIAM	FRENCH	683-2770	W2SRQ@worldnet.att.net
W2TJO	THOMAS	BRERETON	390-9247	tfbrereton@juno.com
W3TMR	MEL	HOSEA	596-8587	mehosea@kktv.com
W6RML	AUSTIN	CLEIS Jr.	495-3177	w6rml@juno.com
WAØIBS	ANDREW	FERRARA	596-5182	sonshein@kktv.com
WAØMNL	ROSIE	CALAWAY	471-9965	RussRosie@kktv.com
WAØTBJ	KIRBY	STAFFORD	596-3522	kstaff2716@aol.com
WAØWJY	ELMER	SCHLADWEILER	471-7328	
WAØYTK	MINT	TANNER	634-7563	
WA2OOD	GREGORY A.	TARCZA	597-7064	gregt@col.hp.com
WA5CRU	MARY	SUDDARTH	392-5675	kgØae@juno.com
WA5RGU	TRAVIS	BRANN	422-3317	tlbmlb@pcisys.net
WA6IFI	DAVE	NOVOTNY	599-8473	Dave-Novotny@hp.com
WA7SDO	DAVID	COPMANN	840-1283	
WBØDUM	GEORGE	LOCKHART	495-3983	tlbmlb@pcisys.net
WBØIMH	DON	ERICKSON	519-8884	don-erickson@juno.com
WBØKLMU	TROY	HANSON	632-1779	
WBØMHP	DOUG	MOLONEY	UL	dougm@col.hp.com
WBØRTF	MOE	PIERCE	550-0406	moe.pierce@juno.com
WBØSDW	DAVID	RIESE	590-7276	dur@rmi.net
WB2EVR	WILLIAM	BELLAMY	591-2378	
WB7THT	RICK	KILE	962-9179	wb7tht@aol.com
WB7WHT	ROBERT	ROLLER	282-0204	rollerr@usa.net
WDØGVH	THOMAS	COX	597-9760	71746.24@compuserve.com
WD4DHR	CLINTON	PETRY II	522-0429	petepetry@aol.com
WL7RV	ROBERT	ANTION	637-8227	bantion@usa.net
WMØT	BARRY	SPRINGER	495-9482	brstlcne@sprynet.com
WV7T	MIKE	ANDERSON	689-8839	wv7t@juno.com
X_____	MARY	PETRY II	522-0429	
X_____	ALEXANDER	KOTLECKI Jr.	392-2477	
X_____	CAROL	KELLEY	632-1867	

Membership Application - Pikes Peak Radio Amateur Association, Inc.

P.O. Box 16521, Colorado Springs, Colorado 80935

Date: _____ New Membership [ ] Renewal [ ]

Name_____

Address_____

City_____State_____Zip_____

Call_____License Class_____Telephone_____

Email Address_____

Are you an ARRL member? Yes [ ] No [ ]

One year membership rates. (Year starts with the month you receive your first issue.)

Full Member $15.00 [ ] Family Membership (same address) $18.00 [ ]
Over 65 $12.00 [ ] Family Membership (both over 65) $12.00 [ ]
Associate $12.00 [ ] Newsletter only $12.00 [ ]

Additional Names:_____Call_____Class_____

Please Note: You must submit a completed application form along with your check to the Treasurer for both new members as well as renewals. Thank you. PLEASE TYPE OR PRINT CLEARLY!